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Higher Education

Features for JULY 1962

Education and the Space Program
JAMES E. WEBB

Universities and the Foreign Aid Program
EDWARD C. FEI

The Center Concept and the Changing Curriculum
DONALD N. BIGELOW

U.S. DEPARTMENT OF
HEALTH, EDUCATION, AND WELFARE
Office of Education

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Education and the National Space Program

By JAMES E. WEBB*

ONE of this country's greatest achievements in the space effort has been the mobilization of large resources of scientific knowledge and advanced technology to achieve clearly defined national goals. Colleges and universities have played a major role in this unprecedented marshaling of research facilities and scientific talent. The partnership of the National Aeronautics and Space Administration with institutions of higher learning has made possible many of the great creative advances in space science and technology.

NASA's Major Aims

The National Aeronautics and Space Administration (NASA) has these major aims:

1. We have begun the exploration of space to increase our scientific knowledge of the earth and its atmosphere, the sun and its variable influences upon earth and nearby regions, the history of the solar system, and the structure and dynamics of the universe. We shall take full advantage of our fast-growing capabilities in space exploration to answer many questions, from the effects of the sun's radiation on the chemistry of the upper atmosphere to the dangers of cosmic radiation for space travelers and the existence of life on other planets. Answers to age-old questions which we get from the extension of scientific inquiry and experimentation further into space in this decade will not only stir men's imagination but may well have profound impact on the destiny of mankind.

2. We seek to give our Nation the ability to sail on "the new ocean of space," as President Kennedy has phrased it, to achieve "a position second to none." This means forcing rapid advances in space technology and in developing the rocket engines, spacecraft, and facilities for ground support and worldwide tracking that will enable us to dispatch men and instruments into space at will and on a routine basis. What is spectacular in space today must be made the commonplace of tomorrow.

3. Since NASA is, as its name indicates, an aeronautics as well as a space agency, we are conducting a vigorous program of aeronautical research and development, including the well-known and highly successful X–15 flights. Recently, an X–15 piloted for NASA by Bob White reached the record height, for an airplane, of more than 59 miles. We are also working to improve the performance of the helicopter and of airplanes that can take off and land vertically, or on very short runways. We are working on a supersonic jet transport that will fly from New York to Paris at three times the speed of sound, in 2½ hours, which we hope will match present jet transports in cruise economy. And in our hypersonic program, we are seeking to open the way to cruise vehicles that will travel at five or more times the speed of sound, to provide the technology that will be applicable to transports, recoverable boosters for spacecraft, and orbital vehicles that will be able to land at selected points under more complete pilot control than is possible with present programs.

4. We are working to achieve practical applications of space technology to improve man's life on earth. In cooperation with other agencies, we are developing the capacity to put earth satellites to work in the fields of meteorology and communications and as

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aids to navigation. We are also seeking to identify advances in aeronautical and space technology—new inventions, new materials, new processes, new engineering and management approaches—which can be used to advantage in our economy, in solving pressing national problems, and in raising our standard of living.

5. We are working toward the very important objective of developing a national space technology and capability so strong and vigorous that the Department of Defense and other agencies can assure that space cannot be used as an avenue of aggression against us.

6. We are, as is required by law, making the widest practicable and appropriate dissemination of information about NASA aeronautical and space experiments and their results. This acts as a stimulus to the spread of scientific knowledge among our own people and facilitates international cooperation.

Some of the most significant events of the present century—certainly of this decade—will take place in space or will stem from space endeavors. They will affect our daily lives, education and the professions, our economy, our international standing and capacity for leadership, and our national security in many ways, some of which we cannot at present foresee.

NASA is a research and development agency. Our job is to provide the ideas, the research, the early engineering, the organizational framework, and the tools for continuous advance in the air and in space.

Since the War, A Giant

During the first four decades of this century, research and development constituted a relatively minor part of the stream of our national activity. During World War II, science was married to the military effort and a vast expansion of research took place. Such new things as radar and the atomic bomb required tremendous mental and physical exertion, and this introduced a new element to science, the requirement for large-scale, organized effort. Invention became the work of organized teams and vast laboratories. Since the war, from this marriage has been born a giant.

In the 12 years from 1946 to 1958, more than $50 billion was spent in this country for scientific research and development by the Government, by universities, and by industry. An equal sum has been spent in the 4 years since 1958, the years of the space age.

At the beginning of the space age, in 1958, the national annual expenditure to acquire new scientific knowledge and to apply the knowledge that had already been accumulated amounted to between $6 and $7 billion. Today this figure has almost tripled, and stands between $16 and $18 billion.

Paradoxically, during the past 12 years as public policy has increasingly favored technical development and our economy has become more and more dependent upon it, the United States has not been training enough technologists to maintain current levels of research and development activities. In fact, in each succeeding year the total number of graduate engineers and technicians has diminished.

According to surveys made by the National Science Foundation, in 1950 the total of engineers and other technically trained men and women graduated by our U.S. universities numbered 50,000. By June 1960, the total had decreased to 37,000. A further decline was noted in 1961, and another decline is predicted for 1962. On the basis of undergraduate enrollments, there will be little improvement in the years immediately ahead, while the demand for engineers is increasing sharply.

In 1960 the Soviet Union graduated a total of 108,000 engineers—2½ times as many as the United States graduated. As of June 1961, the Soviet Union had a manpower pool of about 1,100,000 engineers; the United States, a pool of only 850,000. At the present rate, unless we increase our output of engineers, Russia will further outstrip us by 1965—1,725,000 to 1,100,000. The Soviet Union will also have a pool of 3,500,000 engineering technicians to support their engineers. Unless we increase the scope of our engineering education, we shall have a pool of no more than 1 million technicians by 1970. Only 200,000 of these will be engineering technicians. (The figures in this paragraph are taken from "The Training Placement and Utilization of Engineers and Technicians in the Soviet Union," Engineers Joint Council, New York, 1961.)

This is a disturbing prospect, having grave implications not only for the space program but for every aspect of the strength of our technological-industrial society. Research and development constitute the key to continued progress in an age in which science and technology are becoming ever

more dominant factors. Without an adequate supply of trained specialists, we would inevitably lack the means to accomplish the goals our Nation is setting for itself in this challenging period of history. The poet Archibald MacLeish recently warned, "If we can't produce enough technicians, we may end up as a kind of underdeveloped area ourselves."

We should not overlook the effect this situation may have on the developing countries. The number and quality of the technologists available to these nations is a factor in determining the rate at which they can industrialize or raise their standards of living, and the rate at which they can build their technical educational facilities. If Russia continues to outproduce us in this field, it may well be Soviet engineers and technicians who will shape the growth and ideology of these nations.

As for the space program, in addition to great numbers of trained minds, large and complex facilities are required to support our expanding activities of this decade and this generation. We are pressing forward in many frontier areas of science and technology—such as electronics, metallurgy and materials technology, propulsion, the creation of controlled environments, and the marriage of all these with the life sciences.

To the launch vehicles that must be built and the spacecraft that must be supplied with instruments, we must add the launch and test facilities, the worldwide networks of radio and radar stations for tracking and receiving information, and the many machines and highly perceptive human beings who must read and interpret the electronic messages that come back in great volume from our manned and unmanned spacecraft.

The significant achievement of this decade will be more than a vast increase in theoretical understanding and practically useful knowledge of man and the dynamic universe he inhabits, or the landing of a team of U.S. explorers on the moon. It will be the demonstration, the worldwide image of the will and ability of our Nation to organize and carry out the great effort required to make such an increase in knowledge and such a landing possible.

The national space program in space science, in applications, and in exploration is an enormous undertaking, with great promise for the benefit of all mankind. To achieve the goals we have established, we must marshal the scientific, technical, industrial, and governmental resources of the United States on an unprecedented scale. I am confident it can be done, but the job will require dedication, teamwork, planning, and plain hard work to a degree that the world has seldom seen.

It will require close cooperation with the universities and the scientific community, not only to meet the goals of today, but to create the additional resources of trained intelligence and skills that our accelerated space program and the utilization of its results must have in the near future.

As the space program grows, the demand for scientists and engineers will increase. If we are to accomplish our goals within the time scales demanded by our national interests, our country needs greatly increased numbers of graduates in these fields. The commodity in most critically short supply is highly trained brainpower.

NASA's Programs

NASA is taking steps to help deal with this shortage. We shall begin support of a training program at 10 universities this fall in an effort to increase the supply of scientists and engineers needed in the national space effort.

Each of the 10 universities, representing many parts of the country, will, as an experiment, train 10 predoctoral students in the first year. The 10 universities are selecting candidates for the training grants on the basis of the promise they show of being able to complete their work for the doctorate within 3 years, the normal duration of the program. The grants will be given for 1 year at a time, however, and will be renewable so long as the students maintain a quality of work satisfactory to the university.

The students chosen will receive stipends of $2,400 a year for 12 months' study, and expense allowances up to $1,000 a year according to the practice of individual universities. The universities will be reimbursed for tuition, fees, and other expenses involved in the program. The cost for the first group of trainees will be about $2 million.

The universities will judge candidates on the basis of their academic records, personal qualifications, and plans of research and study. The trainees will be citizens of the United States, in all but exceptional cases approved by NASA. The following institutions have been selected for participation in the first year of the program:

1. Rensselaer Polytechnic Institute, Troy, N.Y.
2. University of Maryland, College Park, Md.
3. Georgia Institute of Technology, Atlanta, Ga.
4. University of Michigan, Ann Arbor, Mich.
5. University of Chicago, Chicago, Ill.
6. University of Minnesota, Minneapolis, Minn.
7. State University of Iowa, Iowa City, Iowa.
8. Texas A. & M. College, College Station, Tex.
9. Rice University, Houston, Tex.
10. University of California, Los Angeles, Calif.

The university training program is administered by the NASA Office of Grants and Research Contracts, Office of Space Sciences.

We depend upon the Nation's educational institutions to provide trained personnel to carry on space and space-related programs. But we also look to academic institutions for strong contributions to our scientific and technological efforts. Currently NASA has contracts and grants in excess of $20 million with over 60 different universities for advanced research and development activities. A fortunate byproduct of these efforts is the support and help provided to schools and colleges in their attempts to build the strong basic educational programs that are essential to our national progress.

Our space program, under the National Aeronautics and Space Act of 1958, is largely unclassified. NASA is required to consult with the scientific community in the design of its program and experiments, and to report not only to the scientific community but also to the general public on the Agency's activities and their results. Further, the fullest measure of cooperation with other nations is specified in this basic act of Congress that established the space policy of the Nation.

Under these circumstances, NASA is contracting as much as possible of this advanced research and development work to universities. Much valuable work of this kind can be done in universities where the scientists themselves, the faculty, and the administration of the university are interested in having the work progress on an interdisciplinary basis, drawing together creative minds, knowledge, and resources from fields such as mathematics, physics, astronomy, chemistry, and medicine for widely shared participation. Our research proceeds in the closest association with graduate and postgraduate education, and thereby replenishes and augments the supply of highly qualified scientists, engineers, and technical experts.

Today, many large industries tend to concentrate in regions where research facilities are best. No area in the Nation can afford to neglect investments in advanced scientific and engineering education and in first-class research facilities.

NASA has also been developing an educational services program designed, within the limits of our scope and mission, to assist schools, colleges, and the public to meet the needs of education in and for the space age. I should like to emphasize the word "services," for we see our role in this field as one of assistance, cooperation, and collaboration, when and where requested.

Our Office of Educational Programs and Services is working closely with many of the National Education Association affiliates, with the U.S. Office of Education, with the National Science Foundation, and with other national organizations and groups having an interest in and responsibility for education.

We are utilizing NASA's scientific and technical sources of space information to develop materials for books, booklets, pamphlets, and educational publications, in cooperation with practicing educators. We are making available to the public in useful form much of the exciting motion picture footage on our rocket launches, on the work of our scientific satellites, and on many other unusual and intriguing technological developments. We are working diligently to make as much as possible of this type of information available to classroom teachers and to adult groups across the Nation and around the world.

We are assisting colleges and universities in organizing and conducting workshops and other programs designed to provide teachers at all age and grade levels with better understanding of space science and technology and of the implications of our push into space.

One of our most successful educational service undertakings has been the spacemobile program. The exhibits and lecturers aboard the spacemobile provide the school, college, or lay audience with accurate, up-to-date information on space science and exploration. A typical demonstration is about 50 minutes long and answers 6 basic questions: What is a satellite? How does it get into orbit? What keeps it in orbit? What does it do? What good is it? What are NASA's plans for future research and space exploration?

We are now trying to meet spacemobile demon-

stration requests with 10 units, operating on very tight schedules.

In the area of educational space exhibits, we are currently booking units ranging from single cardboard panels to collections of full-scale models with supporting panels to provide the public with the basic facts of our space programs. The exhibit activity is growing steadily and rapidly and is becoming international in scope. John Glenn's Friendship 7 spacecraft, for example, is traveling around the world a fourth time, to be exhibited in many countries.

To answer a large number of requests, we are developing programs on space for educational TV channels and the regular commercial networks. In addition, we are working on a series of programs in space science and technology for use by colleges and schools now on the national educational television network. We are assisting the airborne television experiment and will continue to seek other ways of assisting various similar enterprises to enrich the teaching of science and the dissemination of facts about the national space program.

Balance and Breadth

We increasingly find that the important inventions and innovations which carry our space program forward come from those persons who have acquired the deepest and broadest understanding of the laws of nature as they are continuously being revised and clarified at an unprecedented rate.

It is important to bear in mind that what our elementary, secondary, undergraduate, and graduate schools are teaching now will determine in large measure the quality of our space program in future years. I do not mean to imply that our schools, colleges, and universities should produce "space scientists" and "space engineers." It would be folly to concentrate on so-called space science at the price of weakening our basic educational efforts in both the physical and the social sciences.

Fortunately, this is not taking place. It has been said that space science is only science performed in space. The acceleration of research and development in space has heightened appreciation of the importance of research in other fields as well. Our space program is not being carried on at the expense of progress in other research fields. On the contrary, they have grown apace with the expansion of the Nation's research and development activity in space and other endeavors that require large, complex hardware and facilities. For example, the research and development expenditures of the National Science Foundation have grown almost elevenfold, from $15 million in 1956 to the $164 million in the President's budget for the current fiscal year. Those of the Department of Health, Education, and Welfare have expanded almost eightfold, from $86 million to $680 million.

These figures indicate progress on a broad base. The program of space exploration must be an integral part of a balanced national effort in all fields of human knowledge. Our free society is dependent upon the successful integration of the new physical sciences and technologies into our political, economic, social, and educational systems as well as in national security systems.

While most students entering secondary schools and colleges are not thinking of careers in science and engineering, all students should acquire the understanding, appreciation, and knowledge that will enable them to cope with the rapid changes of this technological age. Students not majoring in science obviously do not require the specialized knowledge that professionals require. They should, however, be sufficiently familiar with science, mathematics, and engineering to comprehend the increasingly technological environment in which we live and in which they may be the decision makers of the decades to come.

Similarly, just as the nonscientist student should have a basic understanding of science and technology as they affect society, so should the science or engineering major develop an appreciation of the social sciences, arts, and humanities. Narrow concentration of study within any field of knowledge is incomplete education. It tends to produce a student and a person without the understanding required for a full and responsible life and without the ability to achieve the most that is possible from his scientific and technical training.

Today, we are pushing forward into new and limitless realms of knowledge and human activity. What will happen and how we shape the world of tomorrow will depend on the vision and dedication of men and women who can overcome the compartmental restrictions of science and the humanities, and thus create the kind of world of peace and opportunity that has been man's dream for centuries.

New Frontiers in Education: The Universities and the Foreign Aid Program

By EDWARD C. FEI*

U.S. colleges and universities are playing an increasingly important role in the program of economic assistance to underdeveloped countries administered for the Department of State by the Agency for International Development. During fiscal year 1962, the Agency contracted with 62 institutions of higher education to conduct 103 programs in 37 overseas countries, at a total cost of $119,144,076.

The speech printed below describing their activities was delivered at a meeting of the Rocky Mountain Regional Advisory Committee of the Institute of International Education held at Aspen, Colo., June 15–17, 1962.

THE U.S. university is a key weapon in the Nation's foreign aid program. The long-range battle of the Agency for International Development (AID) is against darkness and disease, against ignorance and misery and inhumanity, against hunger of the body and the soul all over the world—wherever they afflict our brother men, and thus ourselves. Some of the most telling blows have been struck in this battle, some of the most crucial skirmishes won, by engineers, chemists, agriculturists, nurses, professors of law or labor, and other educators carrying the banners of such American universities as Cornell, California, Ohio, Harvard, Wisconsin, Tennessee, and Montana State, and the Massachusetts Institute of Technology in such distant places as India, Brazil, Nigeria, Thailand, Iran, Chile, and the Philippines.

The universities' role is threefold. First, they are a prime source for the recruitment of overseas technicians in all fields—education, engineering, agriculture, housing, public health, law, and medicine, to name but a few. University administrators cooperate by stretching sabbaticals and leaves of absence, or by rearranging classroom schedules on their home campuses in order to enable key faculty members and graduate students to take on crucial overseas jobs.

Second, the universities and colleges—large and small, each according to its academic capabilities and physical plant—provide training resources for people from the various underdeveloped countries brought to the United States by AID for specialized training. This includes both academic and nonacademic training, for some come as regularly enrolled students for specific courses and degrees, and others as short-term or long-term observers in classrooms, seminars, laboratories, and field projects. From southern California and Oregon to Maine and Georgia, there is hardly a major university in the land today that does not have at least one AID-sponsored student somewhere on its campus.

Last year, the Agency was directly responsible for bringing over some 6,500 foreign students for university training. In addition, the individual universities themselves brought over 405 foreign students under their AID-oriented university-to-university contracts, and the African-American Institute, acting in concert with AID, was responsible for the enrollment in U.S. universities of 31 students from Guinea. All this, of course, does not take into account the many hundreds of other foreign students brought to the home campuses by universities and other educational institutions as a part of their independent, nongovernmental aid projects overseas.

The third, and by far the largest, contribution from the universities is in connection with the projects which they undertake for the AID program overseas. As of March 31, 1962, the U.S. Government had awarded 103 foreign aid contracts, totaling almost $120 million, to 62 American universities operating in 37 separate countries. These contracts vary widely in the amounts, periods, and fields involved, but all have this in common: they are carried out in parts of the world and in areas of

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endeavor that are absolutely basic to the social development aspects of foreign aid that the U.S. Government is stressing unflinchingly today. The aim here is a revolutionary change—though, in most cases, many years will have to pass before their benefits will become apparent. These contracts cover projects that range from the training of teachers and writing of textbooks to the installation of American assembly-line methods in a steel mill, from working with farmers out in the field to redirecting or developing curriculums in colleges and technical schools, from the creation and training of an entire government department or ministry in an underdeveloped country to the establishment of a completely new technical school or university there, often starting with the preblueprint stage and going right on through to the construction of the buildings, teaching of students, and graduation of the first matriculated class.

Agricultural Projects

Perhaps the most important field in which the universities are operating under AID contracts is agriculture. In this field, as in the foreign aid program in general, India is of decisive importance. And it is, thus, in India that there is in operation the largest number of university contracts financed by AID in any one country. The total so far is 19, of which all but 3 are still underway. Agriculturally, the entire country is divided on a regional basis among five separate U.S. universities: These are the University of Tennessee in the southern region; Kansas State University in the central region; Ohio State University in the northwest region; the University of Missouri in the northeast; and the University of Illinois in the north central region. Altogether the 20 faculty members of these institutions engaged on these projects work with 43 separate Indian colleges, as well as with research institutions and with the governments of the States to which they are assigned. One agricultural project being carried on in India today by the University of Tennessee began in the spring of 1956 and will end in the winter of 1963. At a total cost of $1,715,000, five faculty members of the university's school of agriculture, assigned on a rotating basis, have been acting as advisers to three State governments in the southern region of India. Their ambitious and exacting task is simply to revolutionize agriculture in the States of Mysore, Madras, and Kerala. Kerala, incidentally, is the only place in the world where the Communists came to power legally by ballots, not bullets (in 1957), and were voted out of power (in 1960). During this period when the Communists held the reins of State government, the University of Tennessee's foreign aid contract continued in operation; its people went on providing training for professors of agriculture and giving equipment and books to the various agricultural schools, went on with their seminars and extension methods, and continued to send students to the United States. (As one of the Americans involved said: "We'd like to think that we had some effect in bringing about the defeat of the Communists in Kerala.")

In addition to this regional agriculture contract, the University of Tennessee also has a nationwide home economics project underway in India. This began in the fall of 1958, involved some $1,050,000, and was scheduled for completion by June 30, 1962. Under this contract, agriculture faculty members from the university work with 40 different Indian colleges in the development of home economics courses. This involves setting up a training program and courses of study, and sending many Indian home economists to Knoxville and surrounding areas to take special courses and observe classes.

Each institution may, like the University of Tennessee, be involved in more than a single AID contract in India alone. For example, the University of Illinois has three contracts: (1) to advise on agriculture at the Allahabad Institute and in the north central region (an 8-year program, totaling almost $2 million); (2) to work with the Indian Institute of Technology at Kharagpur on an engineering project (for 4 years, $600,000); and (3) to develop an agricultural university for the State of Uttar Pradesh. The university contract for the buildings, the curriculum, and the training of faculty came into effect in November 1959 after 20,000 acres of land had been hacked out of the jungle. It is scheduled for completion in November 1963 at a total cost of some $930,000.

Comparable projects, to spark an agricultural revolution (and the necessary affiliated revolutions) by creating a land-grant style college on the American model, where a vacuum had existed before, are being carried out by Oklahoma State and the University of Kentucky. The Oklahoma project, at Aramia, in Ethiopia, is a $7.3 million agricultural college that

has been 11 years building (starting in 1952 and due for completion at the end of next year). The Kentucky project is at Bogor in Indonesia—where a school of agriculture is being added to the already existing University of Indonesia. This is a 7-year project and will be completed in summer 1963, at a total cost of $2.5 million.

Under a contract now being negotiated, Iowa State University will sign a contract to provide all the technical assistance in agriculture to be made available to Uruguay under AID, through the Alianza Para El Progreso. This will be an unusual type of project since no AID personnel will be involved at all in the agriculture technical assistance program in Uruguay. Everything—training, advisory work with the Ministry of Agriculture, development of institutions—will be carried out by university people sent out from Ames.

The emphasis in these university contracts has always been, of necessity, on long-term planning and development. An example of this is the contract signed in early May of this year between the University of Wisconsin and AID Administrator Fowler Hamilton. This contract covered the most ambitious university project perhaps ever undertaken in agriculture and deals with land reform in the entire Latin American region.

Land reform is the greatest need of the underdeveloped countries, particularly in Latin America. It is the key that unlocks any revolution, whether ours or the Communists'. It is also a key that fits much more naturally into our hands than theirs. The United States is a country where farmers are not peasants, where owning land is as natural to our way of life as going down to the supermarket, while the Communists can promise private ownership of land, if they promise it at all, only as a step along the way to collectivization.

The first part of the contract with the University of Wisconsin covers 3 years' operation at a cost of $1.25 million; the second part, which will be signed later, will cover the remaining 2 years. Faculty fieldworkers from the university will range all over Latin America feeding back research on every aspect of land reform to the missions, to the Alianza, to AID in Washington, and to various international agencies occupied with Latin America. "These studies will not just be 'narrowly' agriculture," one of the men in AID's Office of Educational and Social Development said. "They will be going into the matters of language, legal education, anthropology, and history as well."

Multifield Projects

A number of the university projects undertaken for AID cover more than one field. For example, Colorado State University has been engaged, since the middle of 1958, in a combined engineering, agriculture, education, and home economics program with Peshawar University in Pakistan. By the time it is completed at the end of 1963, $1.5 million will have been spent. The University of Nebraska has a 4-year program underway at Ataturk University in Turkey combining agriculture, education, business administration, and engineering; and the University of Minnesota has a similar 4-year program with Seoul National University of Korea, in agriculture, medicine, nursing, public administration, and engineering.

Probably the most important university contract in the entire foreign aid program is for a combined engineering and educational project that started in India on February 21, 1962. This is scheduled for completion by the end of 1964 at a cost of $3.5 million and calls for nothing less than the creation of the equivalent of an "MIT" for India, a complete college of engineering created from the ground up. Since this was considered too vast a job for a single university to handle, an organization called Educational Services, Inc., was formed among nine institutions: Massachusetts Institute of Technology, Purdue University, California Institute of Technology, Carnegie Institute of Technology, Princeton University, Ohio State University, University of Michigan, Case Institute of Technology, University of California.

Educational Projects

The largest number of university projects for AID is, logically, in the field of education. At least 44 educational or educational-plus-other contracts are currently in operation throughout the underdeveloped world. Some of these are regional—as, for example, the $1.7 million contract with the University of Michigan for teaching English in Laos, Thailand, and Vietnam. The underlying purpose of this program of schooling Asians in English is practical, not a matter of whimsy or chauvinism. Before people can become enrolled in American universities or can read technical journals printed

in English, both of which may be essential to their lifting their national economies up by the bootstraps, they have to know the English language.

The program began in August 1958 and should be completed by the end of June 1963. The Michigan academic contingent of nine men and women set up its Southeast Asia Regional English project headquarters in Bangkok and its administrative offices at the College of Education at Prasarnmitr, also in Thailand. From there, national headquarters and staff were set up in the two other member countries, with auxiliary branch offices in local communities. The situation varied from country to country. When the first members of the team arrived at Vientiane in Laos, for example, they discovered that there was not a single Lao teaching English in secondary school. Thus, it became their immediate aim to train Lao teachers of English for secondary schools. However, when they discovered that most of the prospective teachers lacked the required educational background, having had only about 6 years of elementary or, at most, 1 or 2 years of secondary education, they set up a program that consisted not only of specialized courses in English but also general subject-matter courses. The result was the establishment of a National Education Center with an English section providing a 3-year curriculum.

The first class of 30 students began in January 1960. As of the end of 1961, 51 students were enrolled in all 3 years of the English section—with classes conducted on a local level in 6 separate cities.

In Vietnam, things were somewhat simpler. Prospective English teachers, generally, had a firmer academic background and a faculty of pedagogy was in existence at the University of Saigon. A 3-year course almost completely on the teaching of English (except for 3 semester hours per week in Comparative English and Vietnamese) was established. To date, 31 Vietnamese have received secondary teaching certificates in English, and it is expected that by the end of the project approximately 200 will have graduated.

In Thailand itself, with courses arranged through the Prasarnmitr College of Education and with 10 Thai educators on the English teaching staff, a much more ambitious program was instituted. This consisted of special 3-month inservice courses for existing teachers of English and a system of followup visits by staff members to see how student-teachers who had returned to their local schools were putting their newly learned lessons into practice. For those who could not spare the time for the regular 3-month course, there were intensified 2-week seminars for teachers of English at the Bangkok teachers' college and at 11 regional centers. To date, an average of 82 teachers have attended each of these short seminars during the past 3 years, and a total of about 160 have graduated from the longer course.

Meanwhile, other American universities have carried on other educational programs in Southeast Asian nations. In Thailand itself, for example, the Indiana University has conducted a college-level teacher's training program at Chulalongkorn University and at the Prasarnmitr College of Education. Started in September 1958, it should be completed by September 1962 at a cost of almost $3 million. In Cambodia, a rural teachers' training program will soon be started at Seim Reap, where the fabulous Ankor Wat ruins are located. The university to conduct this program has not yet been chosen. The program calls for the development of a new teacher education center in this northern region that will follow the pattern of a recently completed AID project at Kompoug Kantuot in the southern region. The latter, however, under the direction of the Unitarian Service Committee and the University of Pittsburgh, was confined to the training of rural elementary school teachers, 200 of whom were selected each year out of 5,000 applicants for 4-year courses. The new project will train teachers on both the elementary and the secondary school level, and in addition will set up a school for vocational training.

In Pakistan two teacher-training programs have been started from absolute scratch. Before the students could be enrolled and trained, the physical plants of the schools they were to go to had to be established. Both projects began around November 1959, one under the direction of Texas Agricultural and Mechanical College System working with the University of Dacca in East Pakistan, the other conducted by Indiana University with the University of the Punjab in West Pakistan. In each case, the U.S. university officials took part in the design of the buildings and the purchase of equipment as well as in the setting up of curriculums and training of students. Both projects should be completed by November 1963, when a sufficient number of teachers will have

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The Center Concept and the Changing Curriculum

By DONALD N. BIGELOW*

OUR national need to know more about the rest of the world has brought an increasing emphasis on international studies at all levels of instruction. In this context, the "center concept"—the concept of a program, or center, within an institution of higher education to provide instruction in a non-Western civilization closely integrated with study of the modern language of the civilization—assumes increasing importance in the changing curriculum of our liberal arts colleges and graduate schools.

Currently there are 135 programs which can be identified with this concept, and the number continues to grow. Such programs, originally known simply as "area studies," are now more familiarly known on many campuses as "language and area centers." Each program, however, has its own name, which reflects the particular emphasis a university places upon it and represents the peculiar and often unique conditions prevailing on a given campus. For instance, some programs give virtually no attention to language study while others make such study a basic requirement. Under Title VI of the National Defense Education Act of 1958, designed specifically to encourage modern foreign language development, 53 language and area centers on 33 campuses are receiving financial support from the Federal Government.

These programs alone provide ample evidence that a new and dynamic force is at work in U.S. higher education.

The term "non-Western," as used here, embraces all areas of the world not ordinarily included in the traditional liberal arts curriculum. For convenience, irritating though it is to some, the term includes Latin America as well as the Soviet Union, neither of which has, until very recently, figured in the traditional liberal arts curriculum. It is in this broad area, then, that the leaven of the center concept is at work. Consequently, the traditional view, which equated the study of liberal arts with the study of Western civilization, is giving place to one which regards all civilizations as worthy of study. The curriculum for the graduate and undergraduate alike is undergoing noticeable change as university administrators and faculty examine the methods which can best serve to introduce the new international aspects of higher education.

Scholars who are seriously concerned with the center concept envisage language and area study as the basis of interdisciplinary activity which can be carried out in a variety of ways. Instead of being limited by historical epochs or by disciplinary lines, these scholars are concerned with a single world region; language competence is fundamental to their study. This approach, however, does not invalidate the need to offer "regular" course work nor does it challenge in any way the basic academic disciplines. Rather, a language and area program—regardless of what it is called—serves as a nexus among the several disciplines by drawing from them scholars who focus on a specific world region, each in his own fashion, and, in some instances, in collaboration. They constitute, then, a team of specialists comprising, in addition to the linguist and the language teacher, the social scientist and the historian as well as the humanist, and others.

The concept of combining language and area study is not new. It can be traced back to the First World War, but only since World War II has it been widely accepted and, to a significant extent, only in the last decade. Moreover, although it was originally designed for study at the graduate level, the center concept is now influencing both the graduate

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and the undergraduate schools. The American Council of Learned Societies concluded on the basis of a survey made in 1961 (reported in *ACLS Newsletter*) that "increasingly the American undergraduate may study the various non-Western cultures in one or more departments." Whereas formerly he might have been introduced to single classics like the *Analects*, the sayings of Lao-tzu, the *Upanishads*, and the *Bhagavad Gita*, today he may be introduced to the major civilizations of the world not only by the humanists but also by the historians and social scientists, some of whom have cooperated in providing basic texts which are now readily available.

But it is at the graduate level that the center concept is most importantly at work. Here the serious professional task of creating specialists in one or another of the world's regions is being done. Only at this level can the necessary research take place and the new teaching materials be prepared. It is chiefly in the graduate schools that the few teachers who know the less well-known languages and areas of the world are to be found, and it is in the graduate schools that the next generation of teachers for both graduate and undergraduate colleges will be trained.

The Recent Development of Language Study

The two most powerful factors in the development of language and area programs have been the acceptance by the academic world of the need for language competence and the improved instruction in modern foreign languages. A new emphasis has been placed on language by our colleges and universities, and concomitantly, new methods and new tools of language instruction have become available. While this simultaneous development is something short of a miracle, it is no coincidence. *It did not just happen.*

The National Defense Education Act (NDEA) of 1958 has helped lead the scholarly battle against the vast ignorance which existed as recently as 4 years ago about most of the uncommon languages and areas of the world. It has instituted through the language development program of the Office of Education a three-pronged attack on the problem by offering fellowships for graduate students in language and area studies, by supporting basic research in methodology as well as projects leading to the development of materials for teaching the uncommon languages, and by helping to support language and area instruction on a matching basis at those universities which offer, or wish to offer, such instruction. Achievements under this program are outstanding. For instance, about a dozen institutions are now able to offer Hindi-Urdu, the language of 160 million people of India and Pakistan, and there are about 25 teachers who are qualified to teach it. More than 100 students are enrolled in academic year courses in this language alone, compared with 14 in 1958. In addition, during the present summer almost 50 students at the University of Wisconsin are taking courses in Indian civilization; they have a choice of learning Hindi, Kannada, or Telugu. Forty students are attending a summer program on African civilization at Michigan State University, and are learning either Swahili, Ibo, Yoruba, or Hausa; the last three have never before been offered during the summer and only occasionally during the academic year. Enrollments in Chinese have almost tripled in the past 3 years; enrollments in Japanese have nearly doubled. Many examples of the tremendous growth in the number of course offerings, teachers, and students could be given.

More than 1,600 graduate students have received NDEA Modern Foreign Language Fellowships to study 62 different languages (excluding French, German, and Italian) at 60 institutions. It is estimated that about half of these students, while learning a language, have been working for their Ph. D. in a discipline other than language. At present Title VI of the NDEA is supporting research projects in more than 120 different languages of the world. Already linguists and language teachers, spurred on by NDEA, have produced a vast number of modern instructional materials—basic courses, grammars, readers, and dictionaries—as well as studies in methodology. These have been used not only by the centers themselves but by other institutions as well, including the Peace Corps.

The national defense language development program has, in the first 4 years of its operation, spent or committed about $20 million on research, graduate foreign language fellowships, and instruction in language and area studies. The universities have matched some of this money from their own funds, and large sums have been contributed by other sources. For instance, in addition to giving $3 million specifically for language training and research, the Ford Foundation has made grants since

1951 totaling $52 million for graduate area study programs and related activities. Of this amount the Ford Foundation has, since 1959, made long-term grants of over $15 million to 14 major institutions of higher education, only 2 of which do not have NDEA Language and Area Centers. The Ford and NDEA fellowship programs are working cooperatively for a common goal. While these funds support the same objectives and parts of the same programs as do Federal funds, foundation support has been principally for area studies.

NDEA funds have been used primarily to support language development, as was the intent of the act. In both the centers and the fellowship programs conducted under title VI, funds allocated to language and to area have been roughly equal. But in the overall operations under this title, language has been the immediate benefactor. In less than 4 years the Research and Studies Section, Language Development Branch, has carried through a systematic study of the neglected languages of the world, which has helped to transform sporadic beginnings, known simply as area studies, into language and area studies with fully accepted academic requirements. It is largely because of the support by NDEA that programs in the Nation's universities have achieved something of a balance between language and area.

It is most significant that while the present-day insistence on language competence comes largely from the universities, support has come from many quarters. Business, the Government, and foundations alike have all seen the need, all have contributed funds. Cooperation has been effective and largely harmonious. To maintain the balance between research and instruction, between learning a language and teaching the allied area work, and at the same time to attempt to reach the undergraduate level as well as the graduate level have been complicated and far from simple feats. But the expenditure of public and private funds has borne fruit. Language has arrived—and at many levels of instruction.

In 1959, just before NDEA established its first center, almost a hundred so-called area programs were in existence. Today there are at least 135 distinct programs offering graduate degrees for foreign language and area study. It is, perhaps, significant that the State Department's Bureau of External Research, which produced the 1959 edition of *Area Study Programs in American Universities* and which has just completed its latest count of these programs, has entitled its new survey report *Language and Area Study Programs in American Universities*. Nothing could more effectively symbolize the new relationship existing between area study and language training. The last 3 years have witnessed a substantial change in emphasis, greatly strengthening the future expectations of language learning throughout the country and at the same time demanding more professional area competence of the scholar himself.

In academic circles the concept is now becoming widely accepted that an area specialist is one who is principally engaged in offering instruction, performing research, or doing both in an academic discipline dealing primarily with a region of the world apart from his own country. Furthermore, such a specialist should have a broad, general knowledge of the area, a high level of scholarly competence in his own discipline, and, most significantly, should normally have considerable field experience in his area and competence in the languages of the region.

Establishment and Support of Centers

Title VI of the NDEA authorized the *establishment* of language and area centers. This would suggest the creation of something new, something which had had no prior existence. But the number of experts in the uncommonly taught languages and the underdeveloped areas was—*and still is*—severely limited. Moreover, these specialists were located on a few campuses where various types and degrees of language and area programs were in operation, usually on a small scale. Hence, if the act had not been interpreted in such a way as to permit support of already existing programs, the Office of Education would simply have been acting on the principle of robbing Peter to pay Paul. What would have been the point of supporting a newly established center at one university, if this involved recruiting personnel from a program at another?

The early decision of the Office to support those activities which were *new*, regardless of whether a center program started from scratch or was already established, was a major decision, for it determined the subsequent development of the NDEA language and area centers program and, indeed, the course of language and area programs everywhere. At one

stroke the status quo ante NDEA was preserved, to the benefit of new and old centers alike.

Of the present 53 NDEA Language and Area Centers (see *Higher Education*, April 1962, p. 19), less than a third were already established before the act was passed in 1958. These have been as materially assisted by NDEA as have those centers which started afterwards. And their need for assistance has continued unabated. In fact, it is probably greater now than previously. Language and area centers are an expensive, rapidly expanding operation, resources for which are very limited. They are *not* the bread and butter of a university, for while it may be said that English and England "pay," Arabic and Arabia do not. And Africa is way out! At no time in the past would a language and area center program have been in existence had it not been for outside financial support, *and the day is not yet in sight when these programs can be self-supporting* to the same extent as are courses in Western civilization or American history. For instance, one of the oldest centers in the country recently received a million-dollar grant for 10 years, but if it continues to expand as planned may still have to turn to NDEA for support—assuming, that is, that NDEA funds continue—at a rate which would total more than a million dollars in the same 10 year period.

A second group of NDEA centers (a third of the 53 currently operating) can only be classified as having received a visible structure and newer status which was lacking prior to NDEA. Their experience is more that of the first than that of the third group of centers, which are indisputably new. Included in the last third are the four undergraduate language and area centers: at Portland State University, Oreg. (which offers Arabic, Persian, Turkish, and Hebrew to its students), and the Universities of Iowa, Kansas, and Arizona, all of which offer language and area work in the Far East. These exceptions to the rule that centers are on the graduate level were experimental programs, designed to provide some experience on which to base future application of the center concept at the undergraduate level. Thus far, the experiment proves that it can be applied and, with proper safeguards, should be applied.

Federal support prompted the centers which existed prior to NDEA to expand in many directions; the others followed along similar lines. Primarily, intensive language courses were developed where, previously, only nonintensive courses had existed. At the same time, new methods and new instructional materials became available, and they helped transform the teaching of language from the old grammar-translation type of instruction to the audio-lingual type. Starting with NDEA, every attempt has been made to speed up the graduate student's ability to learn an uncommon language so that he might take area work and get to his discipline as rapidly as possible. In this connection, summer intensive language courses have become increasingly necessary and popular. During the summer of 1962 more such programs are being offered than ever before, foreshadowing an even stronger and larger number of programs in 1963. The key to the present bottleneck in learning the uncommon languages (indeed in learning all modern languages) may well be in designing thoughtful cooperative or joint summer programs by groups of universities.

The language and area center program has also caused an expansion of almost equal importance in the so-called area courses. These originally comprised only the humanities (mostly literature), but now include the social sciences, philosophy, and history. This has made necessary a corresponding increase in teachers of these non-Western areas, and some universities without funds to make these new appointments requested and obtained support from the NDEA language and area center program. The area specialists, a new breed, are increasingly found in many centers. Indeed, they have probably gained as much from the language development program as any other single group of scholars. And it is they who have developed the new advanced area courses in economics, political science, philosophy, etc., which were not previously offered since there was neither the need for such courses nor the specialists to give them.

Language and area course work have grown about equally. At present, 53 NDEA centers offer over 66 different uncommon languages, as well as advanced Spanish, all with corresponding area courses. A recent survey indicated that the first 46 centers offered during a single semester a total of 564 courses in the uncommon modern languages and 593 in area studies.

The use of NDEA funds at centers is quite flexible. Funds may be used in conjunction with already established centers or they may be used to

help establish a new and distinct center. At some, funds go almost exclusively for language instruction but at others, which already have well-developed courses, the greater part of these funds may be used specifically for area work. Other allowable activities receive support, and sometimes one of these may dominate a budget. Travel is often supported. In a few instances, the need for funds for library acquisitions and processing exceeds all other needs. Often funds have been used to help the university expand its library and staff, including the highly specialized personnel needed to discover, purchase, and catalog books published in the uncommon languages.

Any university which receives Federal support for a center is responsible for its own pattern of program expansion; the sole proviso is that it meet at least half the cost of new expansion. The doctrine of "local option," the center's right to self-determination, has prevailed from the beginning. Allowable expenses have only to be determined, an acceptable budget drawn up, and the program can be established without specific relationship to other programs. The Office of Education supplies no model. The framework within which each center flourishes is entirely its own creation, designed to fit best its own unique conditions and particular ambitions. A center budget can be viewed as the means by which university requirements are served at the same time that it fulfills the purposes of the act.

Influence of the Center Concept

Since each university structure differs from that of almost every other, often in its basic design and always in detail, language and area programs could not have been standardized, even had the Office of Education so desired. Nonetheless, the basic center concept is at work, and the concept itself has influenced language development and furthered area studies in several distinct directions. A significant result has been the stimulus to interdisciplinary growth, which is accomplished in a variety of ways. Such a development would not perhaps have taken place on many campuses where the individual departments, usually representing a specific discipline, have remained hermetically sealed off from one another. But at many institutions, as language and area centers have grown, a pattern of interdepartmental cooperation has emerged along with general survey courses in non-Western civilizations. This has demanded not only that the faculty members of several area disciplines work together, but that, in many instances, language teachers work more closely with area faculty.

One other unexpected development has occurred, this time at the undergraduate level. Because most elementary courses in the uncommon languages either have been offered through the undergraduate division of the university or are open to all students, greater exposure on the undergraduate level has taken place far more quickly than had been foreseen. This situation is now common as regards Japanese and Chinese, but it was Russian, of course, which led this movement downward to undergraduate instruction. Over 500 colleges and universities now offer some kind of instruction in Russian. On the area side, the undergraduate program has already been affected through the introduction of general courses in non-Western civilizations; and this, too, has begun independently of instruction in the uncommonly taught languages. The NDEA center, however, has often served to bring together these two quite different types of instruction.

The center concept can no longer be regarded as an esoteric matter; it has entered the national scene, not only because of the NDEA but because of its immediate relevance to higher education. The concept itself implies an effort to achieve certain aims beyond those of the liberal arts education as it has been known. It has helped to bring into focus national needs and, at the same time, individual scholarship. It has shown teachers the urgency of pooling resources in research as well as in teaching.

The Concept Grows Clearer

Meanwhile, the center concept grows clearer. The search for an equilibrium characterizes all centers. Surely each center would study a geographical area without confusing it with an academic discipline, would consider language basic to such a study, would encourage interdisciplinary mobility while maintaining its own identity, and while asserting its own unity of purpose would do so without denying academic disciplines or sacrificing individual scholarship. Such a center may con-

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The UNESCO Convention and the UNESCO Recommendation Against Discrimination in Education

By J. BOYER JARVIS*

DURING recent months the U.S. Commissioner of Education, other Government officials, and some Members of Congress have received a number of letters which reveal an unfortunate public misunderstanding of the nature and purpose of the United Nations Educational, Scientific, and Cultural Organization (UNESCO). Some of these letters even express concern lest the United States permit UNESCO to exercise jurisdiction over American education. This concern is occasioned by a definite misconception of the status and purpose of the UNESCO Convention and the UNESCO Recommendation against discrimination in education.

The following statement seeks to correct such misunderstanding. It also provides a concise report concerning the Convention and the Recommendation.

UNESCO, as one of the specialized agencies of the United Nations, is dedicated to enhancing the possibility of peace among nations by seeking constantly to extend the range of international understanding and to bring the benefits of modern science and technology to more and more of the world's population. Through its support of important research and development projects, involving participation by scientists, scholars, and educators from many countries, UNESCO is helping to enlarge man's store of knowledge and to make it more readily accessible wherever it can contribute to the advancement of human welfare. UNESCO makes its resources available, on request, to countries which desire assistance in developing, expanding, and strengthening their educational systems. Recognizing and respecting the independence and autonomy of its more than 100 member states, UNESCO is interested in insuring that in the new and developing nations of the world the opportunities for education, at all levels, will be equal to the needs of peoples who are striving, sometimes against great odds, to overcome the handicaps of centuries of poverty, disease, and ignorance.

UNESCO is clearly prohibited from interfering in the educational policies, or in any other domestic concerns, of its member states. This restriction is written without equivocation into the UNESCO constitution (Art. I, par. 3).

> With a view to preserving the independence, integrity and fruitful diversity of the cultures and educational systems of the states members of this organization, the organization is prohibited from intervening in matters which are essentially within their domestic jurisdiction.

In keeping with its broad purposes and in full harmony with the above restriction, the UNESCO General Conference, consisting of representatives from all UNESCO member states, adopted in 1960 a Convention and a Recommendation against discrimination in education. The decision to draft these documents was made by the UNESCO General Conference in 1958, following studies dating back to 1955 and carried on by a special U.N. Sub-Commission and by members of the UNESCO staff. Both in these earlier studies and in the actual work of drafting the Convention and the Recommendation, official representatives of the Government of the United States played a prominent role. At each stage in this rather long process, they received guidance from officials in the Department of State. In addition, they consulted with officials of the Department of Health, Education, and Welfare, the Department of Justice, the Department of the Interior, the Department of Labor, and other Government agencies having an interest in the general problem of discrimination.

At a very early point in the development of the Convention and the Recommendation against discrimination in education, the United States announced that it did not intend to ratify the Conven-

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tion. That decision was reaffirmed in a letter written by Assistant Secretary of State Brooks Hays to Senator Carl Hayden on July 29, 1961. The letter was entered in the *Congressional Record* for August 3, 1961 (pp. A6013 and A6014). This position was taken in recognition of the fact that in the United States the administration of education is a legal responsibility of State and local agencies. Nevertheless, the representatives of the United States made positive and very helpful contributions to the drafting of both the Convention and the Recommendation. Working with representatives from 40 other countries, they exercised great care to insure that the principles and provisions in the final texts of the two instruments would not in any way be in conflict with the policies and purposes of the United States.

The distinction between the UNESCO Convention against discrimination in education and the UNESCO Recommendation against discrimination in education needs to be emphasized. While the two documents are alike in their basic content and in their purpose to encourage elimination of discrimination based on considerations of race, sex, religion, national or social origin, or economic condition, they differ in one very significant respect. The Convention is subject to ratification by member countries of UNESCO, and when ratified it has the status of an international treaty among the ratifying countries. Thus far only five nations—the Central African Republic, France, Israel, the United Arab Republic, and the United Kingdom—have ratified this Convention.

The Recommendation is simply a carefully written statement of ideals and principles which merit serious consideration by the member states of UNESCO. For the United States, as well as for other nations, it can serve as a basis for comparing our actual achievements with our generally accepted principles of equal educational opportunity for all. The Recommendation clearly recognizes that education is the responsibility of each individual country. An objective examination of this document will show that its purposes are entirely compatible with the traditional administrative pattern of public and private education in the United States, where operation and control of public schools rest firmly in the hands of State and local authorities, and operation and control of private schools reside with their sponsors.

For the information of interested American educators, the full text of the UNESCO Recommendation against discrimination in education is printed here. (The related Convention is similar in all substantive respects. The distinctive features of the Convention text are its provisions dealing with the procedures for its ratification, the means for settling possible disputes between ratifying countries, and other technical considerations.)

Text of the UNESCO Recommendation Against Discrimination in Education

The General Conference of the United Nations Educational, Scientific and Cultural Organization, meeting in Paris from 14 November to 15 December 1960, at its eleventh session,

Recalling that the Universal Declaration of Human Rights asserts the principle of non-discrimination and proclaims that every person has the right to education,

Considering that discrimination in education is a violation of rights enunciated in that Declaration,

Considering that, under the terms of its Constitution, the United Nations Educational, Scientific and Cultural Organization has the purpose of instituting collaboration among the nations with a view to furthering for all universal respect for human rights and equality of educational opportunity.

Recognizing that, consequently, the United Nations Educational, Scientific and Cultural Organization, while respecting the diversity of the national educational systems, has the duty not only to prescribe any form of discrimination in education but also to promote equality of opportunity and treatment for all in education,

Having before it proposals concerning the different aspects of discrimination in education, constituting item 17.1.4 of the agenda of the session,

Having decided at its tenth session that this question should be made the subject of an international convention as well as of recommendations to Member States,

Adopts this Recommendation on the fourteenth day of December 1960.

The General Conference recommends that Member States should apply the following provisions by taking whatever legislative or other steps may be required to give effect, within their respective terri-

tories, to the principles set forth in this Recommendation.

I

1. For the purpose of this Recommendation, the term 'discrimination' includes any distinction, exclusion, limitation or preference which, being based on race, colour, sex, language, religion, political or other opinion, national or social origin, economic condition or birth, has the purpose or effect of nullifying or impairing equality of treatment in education and in particular:

a. Of depriving any person or group of persons of access to education of any type or at any level;

b. Of limiting any person or group of persons to education of an inferior standard;

c. Subject to the provisions of section II of this Recommendation, of establishing or maintaining separate educational systems or institutions for persons or groups of persons; or

d. Of inflicting on any person or group of persons conditions which are incompatible with the dignity of man.

2. For the purposes of this Recommendation, the term "education" refers to all types and levels of education, and includes access to education, the standard and quality of education, and the conditions under which it is given.

II

When permitted in a State, the following situations shall not be deemed to constitute discrimination, within the meaning of section I of this Recommendation:

a. The establishment or maintenance of separate educational systems or institutions for pupils of the two sexes, if these systems or institutions offer equivalent access to education, provide a teaching staff with qualifications of the same standard as well as school premises and equipment of the same quality, and afford the opportunity to take the same or equivalent courses of study;

b. The establishment or maintenance, for religious or linguistic reasons, of separate educational systems or institutions offering an education which is in keeping with the wishes of the pupil's parents or legal guardians, if participation in such systems or attendance at such institutions is optional and if the education provided conforms to such standards as may be laid down or approved by the competent authorities, in particular for education of the same level;

c. The establishment or maintenance of private educational institutions, if the object of the institutions is not to secure the exclusion of any group but to provide educational facilities in addition to those provided by the public authorities, if the institutions are conducted in accordance with that object, and if the education provided conforms with such standards as may be laid down or approved by the competent authorities, in particular for education of the same level.

III

In order to eliminate and prevent discrimination within the meaning of this Recommendation, Member States should:

a. Abrogate any statutory provisions and any administrative instructions and discontinue any administrative practices which involve discrimination in education;

b. Ensure, by legislation where necessary, that there is no discrimination in the admission of pupils to educational institutions;

c. Not allow any differences of treatment by the public authorities between nationals, except on the basis of merit or need, in the matter of school fees and the grant of scholarships or other forms of assistance to pupils and necessary permits and facilities for the pursuit of studies in foreign countries;

d. Not allow, in any form of assistance granted by the public authorities to educational institutions, any restriction or preference based solely on the ground that pupils belong to a particular group;

e. Give foreign nationals resident within their territory the same access to education as that given to their own nationals.

IV

Member States should furthermore formulate, develop and apply a national policy which, by methods appropriate to the circumstances and to national usage, will tend to promote equality of opportunity and of treatment in the matter of education and in particular:

a. To make primary education free and compulsory; make secondary education in its different forms generally available and accessible to all; make higher education equally accessible to all on the basis of individual capacity; assure compliance by all with the obligation to attend school prescribed by law;

b. To ensure that the standards of education are equivalent in all public educational institutions of the same level, and that the conditions relating to the quality of the education provided are also equivalent;

c. To encourage and intensify by appropriate methods the education of persons who have not received any primary education or who have not completed the entire primary education course and the continuation of their education on the basis of individual capacity;

d. To provide training for the teaching profession without discrimination.

V

Member States should take all necessary measures to ensure the application of the following principles:

a. Education shall be directed to the full development of the human personality and to the strengthening of respect for human rights and fundamental freedoms; it shall promote understanding, tolerance and friendship among all nations, racial or religious groups, and shall further the activities of the United Nations for the maintenance of peace;

b. It is essential to respect the liberty of parents and, where applicable, of legal guardians firstly to choose for their children institutions other than those maintained by the public authorities but

conforming to such minimum educational standards as may be laid down or approved by the competent authorities and, secondly, to ensure, in a manner consistent with the procedures followed in the State for the application of its legislation, the religious and moral education of the children in conformity with their own convictions; and no person or group of persons should be compelled to receive religious instruction inconsistent with his or their convictions;

c. It is essential to recognize the right of members of national minorities to carry on their own educational activities, including the maintenance of schools and, depending on the educational policy of each State, the use or the teaching of their own language, provided however:

(i) That this right is not exercised in a manner which prevents the members of these minorities from understanding the culture and language of the community as a whole and from participating in its activities, or which prejudices national sovereignty;
(ii) That the standard of education is not lower than the general standard laid down or approved by the competent authorities; and
(iii) That attendance at such schools is optional

VI

In the application of this Recommendation, Member States should pay the greatest attention to any recommendations hereafter adopted by the General Conference of the United Nations Educational, Scientific and Cultural Organization defining the measures to be taken against the different forms of discrimination in education and for the purpose of ensuring equality of opportunity and of treatment in education.

VII

Member States should in their periodic reports submitted to the General Conference of the United Nations Educational, Scientific and Cultural Organization, on dates and in a manner to be determined by it, give information on the legislative and administrative provisions which they have adopted and other action which they have taken for the application of this Recommendation, including that taken for the formulation and the development of the national policy defined in section IV as well as the results achieved and the obstacles encountered in the application of that policy.

The foregoing is the authentic text of the Recommendation duly adopted by the General Conference of the United Nations Educational, Scientific and Cultural Organization during its eleventh session, which was held in Paris and declared closed the fifteenth day of December 1960.

Office of Education Studies and Surveys

1,524 Institutions in 1962-63 Student Loan Program

COLLEGES AND UNIVERSITIES participating in the student loan program next year will total 1,524, an increase of 79 over the total for 1961–62. Of these, 1,446 have filed applications requesting $98,314,730 in Federal capital contributions. This is $24,480,200 more than was requested for 1961–62. Seventy-eight institutions have not filed applications, as they do not require additional funds for fiscal year 1963.

All applications were reviewed by a panel of consultants composed of college administrators appointed by the Commissioner of Education. Preliminary announcement of amounts allocated to each institution was made on June 28.

Among the institutions applying, 22 colleges and universities have filed provisional applications for a total of $2,990,608, stipulating that their participation next year will be contingent on the removal of the disclaimer affidavits. These institutions are as follows:

Amherst College (Mass.)
Antioch College (Ohio)
Bennington College (Vt.)
Boston University
Brandeis University (Mass.)
Colby College (Maine)
Harvard University (Mass.)
Iliff School of Theology (Colo.)
Mills College (Calif.)
Mount Holyoke College (Mass.)
Oberlin College (Ohio)
Pacific Oaks College (Calif.)
Princeton University (N.J.)
Reed College (Oreg.)
Sarah Lawrence College (N.Y.)
Smith College (Mass.)
Swarthmore College (Pa.)
University of Chicago (Ill.)
Vassar College (N.Y.)
Wesleyan University (Conn.)
Wilmington College (Ohio)
Yale University (Conn.)

Baccalaureates in Science and Mathematics in 1962

OFFICE OF EDUCATION estimates of the number of baccalaureates conferred in science and mathematics during 1962 show an increase of more than 11 percent over the number conferred in 1960 (see table 1). The largest increase is shown in mathematics, with about

Table 1.—Junior-year majors in science and mathematics reported each fall 1958–60; graduates reported in 1959–60 and expected through 1961–62 on basis of junior-year majors; by field of study: Aggregate United States [1]

Field of study	Junior-year majors [2]			Estimating ratio (graduates in 1959–60 to juniors in fall 1958 or col. 6 ÷ col. 2)	Graduates (bachelor's degrees)			Expected percent change in graduates 1959–60 to 1961–62 [3] (2-year interval)
	Fall 1958	Fall 1959	Fall 1960		Actual 1959–60	Expected 1960–61 (col. 3 × col. 5) [4]	Expected 1961–62 (col. 4 × col. 5) [4]	
1	2	3	4	5	6	7	8	9
ALL SCIENCES AND MATHEMATICS	55,777	57,265	62,213	0.81	45,300	46,400	50,400	11.5
BIOLOGICAL SCIENCES	21,089	21,207	23,753	.74	15,655	15,700	17,600	12.6
Premedical, predental, and preveterinary sciences; and biology general	17,100	16,912	18,835	.68	11,591	11,500	12,800	10.1
Premedical, predental, and preveterinary sciences [5]	8,194	7,514	7,778	(5)	3,182	(5)	(5)	(5)
Biology, general [5]	8,906	9,398	11,057	(5)	8,409	(5)	(5)	(5)
Botany, general	347	394	409	1.07	370	400	440	17.9
Zoology, general	2,263	2,307	2,696	.99	2,250	2,300	2,700	19.1
Anatomy and histology	99	130	154	1.23	122	160	190	55.6
Bacteriology, virology, mycology, parasitology	547	677	712	.97	533	660	690	30.2
Biochemistry	162	215	181	.67	108	140	120	11.7
Entomology	107	128	125	1.01	108	130	130	16.8
Biological sciences, all other [6]	464	444	641	1.45	674	640	930	38.1
MATHEMATICAL SUBJECTS	11,961	14,065	15,773	.96	11,437	13,500	15,100	31.9
PHYSICAL SCIENCES	19,814	19,295	19,852	.81	16,057	15,600	16,100	.2
Physical sciences, general (without specific major)	1,065	1,148	1,146	1.12	1,198	1,300	1,300	7.6
Chemistry (excluding biochemistry)	9,231	9,389	10,135	.82	7,603	7,700	8,300	9.8
Meteorology	113	144	103	1.78	201	260	180	−8.9
Physics (excluding biophysics)	5,826	6,036	6,438	.74	4,338	4,500	4,800	10.5
Earth sciences	3,353	2,427	1,875	.77	2,570	1,900	1,400	−44.1
Geology	3,206	2,286	1,736	.76	2,248	1,700	1,300	−45.9
Earth sciences, all other	147	141	139	.97	142	140	140	−5.4
Physical sciences not classifiable above	226	151	155	.65	147	100	100	−31.4
SCIENCES, GENERAL PROGRAM	2,913	2,698	2,835	.74	2,151	2,000	2,100	−2.7

[1] The term "Aggregate United States" refers to the 50 States, the District of Columbia, and outlying parts (Canal Zone, Guam, and Puerto Rico).

[2] Does not include special, unclassified, extension, or correspondence students.

[3] Based on change in junior-year majors from fall 1958 to fall 1960.

[4] The figures in these columns were computed from unrounded data and then rounded.

[5] These 2 categories are shown separately to indicate the general magnitudes of the figures reported in them, but no computations are made for these categories considered separately because little or no distinction between them is made in a number of institutions.

[6] This category includes fields of specialization not listed above, such as cytology, embryology, morphology, etc. Note that the health professions are not included in this category or elsewhere in this report.

Table 2.—Junior-year majors in science and mathematics reported each fall 1958–60, graduates reported in 1959–60 and expected through 1961–62 on basis of junior-year majors, by broad field of study and by sex: Aggregate United States

Field of study and sex	Junior-year majors [1]			Estimating ratio (graduates in 1959–60 to juniors in fall 1958 or col. 6 ÷ col. 2)	Graduates (bachelor's degrees)			Expected percent change in graduates 1959–60 to 1961–62 [2] (2-year interval)
	Fall 1958	Fall 1959	Fall 1960		Actual 1959–60	Expected 1960–61 (col. 3 × col. 5) [3]	Expected 1961–62 (col. 4 × col. 5) [3]	
1	2	3	4	5	6	7	8	9
MEN								
All sciences and mathematics	44,503	44,698	48,279	0.80	35,761	35,800	38,600	8.5
BIOLOGICAL SCIENCES	16,350	15,955	17,806	.72	11,693	11,500	12,800	8.9
Premedical, predental, and preveterinary sciences; and biology, general	13,513	12,978	14,399	.64	8,682	8,300	9,200	6.6
All other biological sciences	2,837	2,977	3,407	1.06	3,011	3,200	3,600	20.1
MATHEMATICAL SUBJECTS	8,604	9,979	11,261	.97	8,312	9,700	10,900	30.9
PHYSICAL SCIENCES	17,456	16,882	17,183	.80	14,041	13,500	13,700	−1.6
Chemistry	7,419	7,524	8,030	.81	6,005	6,100	6,500	8.2
Physics	5,577	5,748	6,179	.75	4,166	4,300	4,600	10.8
Geology	3,095	2,191	1,635	.76	2,353	1,700	1,200	−47.2
Other physical sciences	1,365	1,419	1,339	1.11	1,517	1,600	1,500	−1.9
SCIENCES, GENERAL PROGRAM	2,093	1,882	2,029	.82	1,715	1,500	1,700	−3.1
WOMEN								
All sciences and mathematics	11,274	12,567	13,934	.85	9,539	10,700	11,800	23.6
BIOLOGICAL SCIENCES	4,739	5,252	5,947	.84	3,962	4,400	5,000	25.5
Premedical, predental, and preveterinary sciences; and biology, general	3,587	3,934	4,436	.81	2,909	3,200	3,600	23.7
All other biological sciences	1,152	1,318	1,511	.91	1,053	1,200	1,400	31.2
MATHEMATICAL SUBJECTS	3,357	4,086	4,512	.93	3,125	3,800	4,200	34.4
PHYSICAL SCIENCES	2,358	2,413	2,669	.85	2,016	2,100	2,300	13.2
Chemistry	1,812	1,865	2,105	.88	1,598	1,600	1,900	16.2
Physics	249	288	259	.69	172	200	180	4.0
Geology	111	95	101	.68	75	70	70	−9.0
Other physical sciences	186	165	204	.92	171	150	190	9.7
SCIENCES, GENERAL PROGRAM	820	816	806	.53	436	430	430	−1.7

[1] Does not include special, unclassified, extension, or correspondence students.

[2] Based on change in junior-year majors from fall 1958 to fall 1960.

[3] The figures in these columns were computed from unrounded data and then rounded.

31 percent more men and about 34 percent more women earning bachelor's degrees in this field (see table 2). Baccalaureates in the biological sciences show an estimated 13 percent increase. The total for the physical sciences, however, indicates little change; although degrees earned by women show an increase of about 13 percent, those by men show a decrease of about 2 percent.

During the 11-year period 1950–60, baccalaureates in the biological sciences fell from 22,521 in 1950 to 16,730 in 1960 (a decrease of about 26 percent); those in the physical sciences fell from 19,653 in 1950 to 17,133 in 1960 (a decrease of about 13 percent); while baccalaureates in mathematical subjects rose from 6,392 in 1950 to 11,437 in 1960 (an increase of nearly 79 percent). (See "Earned Degrees in Crucial Manpower Fields," *Higher Education*, March 1962, p. 12.)

The comparison of bachelor's degrees in science and mathematics conferred in 1960 with those estimated for 1962 reveals these facts:

- In the totals for science and mathematics combined, women's degrees show an increase of about 24 percent; men's somewhat less than 9 percent.
- The total for mathematics shows an increase of about 32 percent.
- In the biological sciences, women's degrees show an increase of about 26 percent; men's about 9 percent. The larger fields within this general area show no decreases, and some fairly large increases appear in anatomy and histology (approximately 56 percent); bacteriology, virology, mycology, and parasitology (approximately 30 percent); and zoology (approximately 19 percent).
- Degrees in specific fields of the physical sciences show advances in physics (approximately 11 percent); in chemistry (approximately 10 percent); and in the physical science general program (approximately 8 percent); but these are shown as offset by a decrease of about 44 percent in the earth sciences.
- A decrease of about 3 percent is indicated in the "sciences general program," with the total for men decreasing approximately 3 percent and that for women approximately 2 percent.
- A comparison (not shown in the accompanying tables) of total junior-year enrollments in 1958 and 1960 shows that the number of men increased by about 2.6 percent and of women by about 16.1 percent; and that junior-year majors in science and mathematics increased by about 8.5 percent for men and 23 percent for women.

Figures for baccalaureates in science and mathematics in 1960 and estimated for 1962 are given in *Bachelor's Degrees in Science and Mathematics Expected for 1961–62*, and *Junior Year Enrollments in Science, Mathematics, and Foreign Languages*, both by Wayne E. Tolliver.

National Defense Education Act Notes

Language Research and Studies Program Activity

THE LANGUAGE research and studies program (title VI) has completed contracts in fiscal year 1962 for 38 projects designed to strengthen modern foreign language instruction at all educational levels. Cost of these new projects and those continued from the previous 3 years totals about $2 million for fiscal 1962.

Of the 38 projects, 11 were surveys and studies of the status of language instruction in the schools and colleges; 22 were for the development of specialized instructional materials, including readers, basic courses, and grammars for the neglected languages; and 5 were for research in the application of phonetics and learning and linguistic theory to foreign language instruction.

This activity brings the total number of projects financed by this program in the first 4 years to 199, at a cost of $10.2 million. Of these projects, 131 have been completed, 50 within the past fiscal year. Materials completed by August 1961 are described in the Office of Education publication *Completed Research, Studies, and Instructional Materials in Modern Foreign Languages: List No. 1.* A second list is in preparation.

Teaching materials developed under NDEA language research and studies contracts are currently being published and distributed nationally. One notable example is the series of audiolingual materials for the teaching of French, German, Italian, Russian,

and Spanish, developed under contract with the Glastonbury, Conn., public schools. During the 1961–62 school year these materials were used by more than 140,000 pupils in secondary schools throughout the Nation.

Another project including about 100 separate items was designed to provide studies and teaching materials in the Uralic and Altaic languages. Sixty-four of these works have been completed, 31 of them during the past fiscal year. Of the completed items, 9 volumes or sets of specialized instructional materials have been published, 16 are nearing publication, and 39 will soon be available on microfilm.

In addition to this portion of the Uralic-Altaic series, published reports and findings have been made available from 7 studies and surveys, 10 sets of specialized teaching materials for the neglected languages have been published, and 2 projects dealing with methods of instruction have been completed during fiscal year 1962.

Neglected Modern Foreign Languages: Manpower Survey

THE Modern Language Association of America, under contract with the Office of Education, is conducting a detailed survey of available manpower at U.S. colleges and universities in the modern foreign languages not commonly taught in U.S. institutions. The survey will show the enrollment in all foreign languages other than French, German, Italian, Russian, and Spanish at junior colleges, senior colleges, and universities during the academic year 1962–63 and the summer of 1963; the names of persons teaching or capable of teaching such languages, and their training and experience; descriptive data on the content, methods, and aims of courses taught; student career goals; and projected extension of such language study to other academic levels.

The so-called uncommon languages are spoken by about three-quarters of the human race and include the highly important Arabic, Chinese, Hindi-Urdu, Japanese, Portuguese, and many others. The survey will make it possible to estimate the degree to which higher education is meeting the national need and the demand for persons competent in these languages.

Many of these languages are receiving support under the language development program (title VI) of the National Defense Education Act in the form of fellowships, language and area centers, and projects of research and studies. The present survey is being financed under this program, $10,000 being paid from funds allocated for fiscal year 1962 and the balance, $41,591, from funds for fiscal year 1963. The survey, which was begun in mid-May, will be completed in the fall of 1963. John Harmon of the Modern Language Association is directing the project.

Survey of Summer Intensive Language Programs

A FIELD survey and study of 1962 NDEA and other intensive summer instruction programs in the uncommon languages will be made this year by four noted linguistic scholars, under contract with the title VI language research and studies program.

The recent increase in the number of intensive summer language programs offered at U.S. institutions of higher education has created the need for a survey and study to define more clearly the possibilities and limitations of such programs and to identify excellent practices, both administrative and pedagogical, which have been developed at institutions conducting these programs. Results of the study will be made available to institutions planning intensive language courses for future summers.

Joseph K. Yamagiwa, chairman of the Department of Far Eastern Languages and Literatures at the University of Michigan, will be the principal investigator, assisted by Henry Hoenigswald of the University of Pennsylvania, Richard Noss of the Foreign Service Institute, and Ernest McCarus of the University of Michigan. The project, which began June 22, will be completed by November 30, 1962, at a total cost of $9,362.

New Chief Appointed to Graduate Fellowship Program

EVERETT WALTERS, dean of the Graduate School at Ohio State University, has been named chief of the national defense graduate fellowship program to succeed Harold Howe. Dr. Howe has returned to his post as dean of the Graduate School at Kansas State University.

Dr. Walters will serve as chief of the Graduate Fellowship Branch of the Division of College and University Assistance while on leave from the Ohio

State University, where he has been dean of the Graduate School since 1956 and a member of the faculty of the department of history since 1946. He has also served as secretary-treasurer of the Association of Graduate Schools and as president of the Midwest Conference on Graduate Study and Research. He received his A.B. degree from the University of Cincinnati and his M.A. and Ph. D. degrees from Columbia University.

The graduate fellowship program will begin its fourth year of operation this fall, when 4,500 fellows will be studying in 819 approved graduate programs.

Pilot Institutes in English Composition

THE University of Pittsburgh, under a contract with the Office of Education (title VII, Educational Media), will conduct a series of pilot institutes in the summers of 1962 and 1963 for college teachers of English composition.

The institutes offer training in a new method of instruction in English composition at the college freshman level. This method is based on the overhead projection of visual materials and has been used successfully during the past 2 years in an experiment conducted by Edwin L. Peterson of the university's English department.

Three 10-day institutes are being held in June, July, and August 1962, and three in the same months in 1963. Enrollment at each institute is restricted to 30 qualified faculty members of English departments at other colleges and universities. Each institute offers the basic course in English composition designed, with the assistance of outstanding consultants in this field, for use with the new method; training in the technical preparation of transparencies for use in this method; and study and analysis of the complete set of transparencies developed at the University of Pittsburgh for this course.

Total amount of the contract is $22,839, of which $12,839 is being paid out of fiscal year 1962 funds and $10,000 out of fiscal year 1963 funds.

Dr. Peterson is directing the project.

Other Program Notes

NSF Announces Five Fellowship Programs 1962–63

THE National Science Foundation has announced five programs of fellowships for this fall:

• Approximately 100 senior postdoctoral fellowships and approximately 400 science faculty fellowships will be awarded in December 1962 for study or research at any appropriate U.S. or foreign nonprofit institution. The fellowships will be awarded in the mathematical, physical, medical, biological, and engineering sciences; geography; anthropology; psychology (excluding clinical psychology); sociology (excluding social work), economics (excluding business administration); the history and philosophy of science; and certain interdisciplinary fields covering two or more sciences.

Eligibility requirements for senior postdoctoral fellowships include U.S. citizenship, special aptitude for advanced training, and a doctoral degree in one of the basic fields of science, mathematics, or engineering held for a least 5 years (or its equivalent in training and research experience). Eligibility requirements for science faculty fellowships include U.S. citizenship, a baccalaureate degree (or its equivalent), a demonstrated ability for science teaching and advanced training, at least 3 years of experience in full-time teaching at the college level, and the intention to continue teaching. Annual stipends, to a maximum of $15,000, will match as closely as possible the fellow's salary for the 1962–63 academic year. Limited allowances for travel will be available.

Closing date for the receipt of applications is October 8, 1962; awards will be announced on December 10. Application materials are obtainable from the Fellowships Section, Division of Scientific Personnel and Education, National Science Foundation, Washington 25, D.C.

• Approximately 65 postdoctoral fellowships will be available in October 1962 for persons planning to begin or continue postdoctoral study. They will be available in the same fields and tenable at the same institutions as the fellowships mentioned above.

Eligibility requirements include U.S. citizenship, a doctoral degree or its equivalent in research train-

ing and experience in one of the fields listed, and demonstrated ability and special aptitude for advanced scientific training.

Awards are normally for 1 academic or calendar year; the annual stipend is $5,000, or, for awards extending beyond 12 months, at the rate of $5,500 a year after the first year. Limited allowances are available for dependents, travel, and costs of research, tuition, and fees.

Application materials may be obtained from the Fellowship Office, National Academy of Sciences-National Research Council, 2101 Constitution Avenue NW., Washington 25, D.C. The deadline for receipt of completed applications is September 4, 1962; awards will be announced on October 15.

• 176 colleges and universities will participate in the cooperative graduate fellowship program for the academic year 1963–64. All but five of these institutions will also participate in the program of summer fellowships for graduate teaching assistants in the summer of 1963. Fields in which the awards will be made under these two programs are the same as those listed for the senior postdoctoral fellowships. Tenure is limited to institutions conferring doctoral-level degrees in the sciences, mathematics, or engineering which have agreed to participate in these programs.

Eligibility requirements for a cooperative graduate fellowship include U.S. citizenship, demonstrated ability and special aptitude for advanced scientific training, and admission to graduate status by the participating institution of the candidate's choice prior to the start of his fellowship tenure. To be eligible for a graduate teaching assistant fellowship an applicant must be a graduate student who is currently attending an institution that is participating in the program and he must have, by June 1963, at least 1 full year's experience as a graduate teaching assistant.

Awards under the cooperative graduate fellowship program are made initially for either 1 regular academic year or for 1 regular academic year plus a full summer session, but may be renewed if applicants continue to meet the eligibility requirements. The stipends are $2,400 for the 12-month period, or $1,800 for the academic year only. The participating institution receives a $2,500 cost-of-education allowance for each fellow to cover the cost of tuition and other fees, and may at its discretion supplement the fellow's stipend at a rate not to exceed $1,000 for a fellow on a 12-month tenure, or $750 for a fellow on an academic year tenure.

Awards for graduate teaching assistants fellowship for the summer session are normally 8 to 12 weeks. Fellows receive stipends ranging between $50 and $85 per week, the exact amount being determined by the institution. The Foundation pays the cost of tuition and fees.

In both programs, candidates apply through the participating institutions. Lists of these institutions and application materials can be obtained from the Fellowships Section, Division of Scientific Personnel and Education, National Science Foundation, Washington 25, D.C. Applications for cooperative graduate fellowships must be received by the participating institutions by November 1, 1962; for summer fellowships, by December 7, 1962.

AEC Awards Grants to 132 Institutions

THE U.S. Atomic Energy Commission has approved 138 grants totaling $1,477,885 to 132 educational institutions for the purchase of laboratory equipment and the fabrication of neutron and gamma sources. The grants will be used to initiate or expand curriculums in the life and physical sciences and engineering related to nuclear energy. Fifty-one of the colleges and universities are receiving Commission grants for the first time.

The grants are in two general categories: 82 physical sciences and engineering awards totaling $985,129 to 82 institutions, including $33,035 for fabrication of sources; and 56 life sciences awards totaling $492,756 to 55 institutions.

These awards bring to $22.8 million the total assistance provided to 505 educational institutions for laboratory equipment to be used in nuclear education since the program was initiated 6 years ago.

NSF Grants for Science Teaching Equipment

THE National Science Foundation has made 42 grants totaling $587,455 to 37 colleges and universities and 1 research institute located in 22 States and the District of Columbia. The grants are designed to aid in the development of new laboratory equipment needed to acquaint students with current advances in modern science and engineering.

Grantees are expected to supply teachers with full information about apparatus they devise and to permit interested commercial suppliers to enter into negotiations for the production and marketing of equipment developed.

The present awards bring to a total of 150 the number of grants made under the science teaching equipment development program since it was started in 1959.

New Frontiers

(*From p. 11*)

been trained to staff the faculties completely with native-born Pakistanis. The East Pakistan project will cost $660,000; the West Pakistan project, $966,000.

A university contractor is now being selected for a teacher-training program in the French-speaking West African nation of Mali. There are complications here because the teacher-training specialists must be bilingual in French and English. According to latest AID thinking, some kind of arrangement involving several U.S. universities will probably be worked out, and the program may be extended to the nation of Senegal, which is also French speaking. The joint program will probably take from 5 to 7 years. Here, again, the job will have to be done from the ground up, starting with the construction of buildings (and perhaps, even before that, the clearing of the jungle) before a single student can be enrolled.

Projects in Other Fields

Although education, agriculture, and engineering are their major fields of endeavor in this program, U.S. universities are engaged overseas in many other AID-sponsored projects. The University of Michigan, for example, started an approximately $250,000, 2½-year public administration project in June 1961 in the Republic of China. Cornell University has a 4-year, $300,000 labor affairs program underway at the University of Chile, and it also has a 2-year program costing $24,000 in the health field with the Government of Peru. The University of Chicago has an 8-year economics project underway at the Catholic University of Chile, mainly having to do with the development of a faculty of economics there, and under Alianza Para El Progreso thinking, which stresses Latin American regionalism, this project is being expanded to include Argentina as well. The University of Buffalo has a program of medical education at the National University of Asunción in Paraguay; Carnegie Institute of Technology has an intensive 2-year, $700,000 program, started in February 1962, in industrial training with the Hindustan Steel Co. of India; Spring Garden Institute, of Philadelphia, has an 8-year, $1.5 million program in automative mechanics underway with the Ministry of Education in Turkey; Northwestern University has a public administration program in Liberia; the Indiana University has a half-million-dollar audiovisual program with the Government of the Western Region of Nigeria. And there are hundreds of others, scattered all over the underdeveloped world.

All these university projects, the technical sinews of the foreign aid program, are today becoming integral parts of the American people-to-people diplomacy. Certainly, the calls AID makes on the colleges and universities will not diminish in importance or magnitude. Rather, the programs themselves are sure to grow and the number of projects to increase, and with them the cooperation between the faculty and AID, as the developing countries all over the world continue to expand and to take their places in the ranks of free people.

Center Concept

(*From p. 16*)

centrate on graduate work but is not restricted to it.

Thus the NDEA language and area center program, as administered by the Office of Education, has many dimensions. Chief among them is the cumulative effect the supported programs will have on the changing curriculum of the American college.

But there are other, more immediate, considerations: The maintenance of a proper balance between language and area, despite the fact that each world region imposes different demands and each university

places different emphases on these programs; the weighing of academic considerations against overall national needs; the correct and legal interpretation and implementation of the act; and the guarding of the center's right to self-determination, free of Federal interference.

Meanwhile the center concept, always malleable, is constantly changing in the process of practical application. No longer is it concerned only with graduate students at home. Already it has broadened considerably and now includes graduate study abroad; the associated problem of centers abroad; the persistent problems of foreign travel for teachers and students alike; joint or other summer intensive language programs; postdoctoral study at home and abroad, chiefly for college teachers who wish to retool by shifting into another discipline or who wish to learn the language they now need; instruction at the undergraduate level in both area and language, in this country and elsewhere. Finally, the center concept must take into account and help to define the new role of non-Western studies in the undergraduate curriculum.

These are but some of the major considerations of the moment, but they are evidence enough that the center concept, deeply involved as it is with the foreign and international aspects of education, bids fair to become pivotal in any reexamination of American education at the college and university level.

THE CENTER CONCEPT with its challenge to departmental parochialism and its recognition of the international dimensions of education has already achieved academic respectability and has helped to replace the extracurricular and often highly emotional approach to "international understanding" with a scholarly apparatus suited to academic needs. Its ultimate effect may well be to so revitalize and reinvigorate the liberal arts that they may once again become a dominant force in our national life.

EDITOR'S NOTE.—Copies of *Resources for Language and Area Studies*, A Report on an Inventory of the Language and Area Centers Supported by the National Defense Education Act of 1958, by Joseph Axelrod and Donald N. Bigelow, are available from the American Council on Education, 1785 Massachusetts Ave., Washington 6, D.C., at $2 each.

NEW PUBLICATIONS

Government Publications

How To Obtain

(*1*) *Cost Publications: Send request, enclosing remittance (check or money order), to the Superintendent of Documents, U.S. Government Printing Office, Washington 25, D.C.*

(*2*) *Free Publications: Request direct from the agency issuing them.*

From the Office of Education

Educational AM and FM Radio, and Educational Television Stations, by State and City, prepared by Gertrude G. Broderick, Washington, U.S. Department of Health, Education, and Welfare, Office of Education, April 1962. 25 p. (OE–34016)

Library Facilities Planning Aids, by E. Eugene Higgins, Mary B. Fuller, and Dorothy M. Jones. The third in the College and University Physical Facilities Series. Washington, U.S. Department of Health, Education, and Welfare, Office of Education, March 1962. 15p. (OE–51004–3)

Gives statistics, as of December 31, 1957, for the aggregate United States, by region and State, of the total number of students who could be seated at one time in higher education library reading rooms, the percentage of the total enrollment that this represents, and the average area assignable for library purposes. Lists by State and institution the library buildings occupied for the first time during the decade 1948–57. Includes a bibliography on planning library facilities.

Statistics of Public Library Systems Serving Populations of 50,000 to 99,999: Fiscal Year 1960, by Frank L. Schick, Henry T. Drennan, and Doris C. Holladay. Washington, U.S. Department of Health, Education, and Welfare, Office of Education, March 1962. 27 p. (OE–15034)

Transfers to Schools or Colleges of Engineering 1951–1953, 1959–1961, by Henry H. Armsby. Washington, Department of Health, Education, and Welfare, Office of Education, March 1962. 7 p. (OE–54005–61–A)

The Technical Assistance Training Program in

Education: Annual Report, 1959–60, by the Technical Assistance Section, Educational Exchange and Training Branch, Division of International Education. Washington, Department of Health, Education, and Welfare, Office of Education, 1962. 47 p. (OE–14046–60)

U.S. Government Films for Public Educational Use—1960, by Seerley Reid, Katharine W. Clugston, and Annie R. Daugherty. Washington, U.S. Government Printing Office, 1961. 502 p. $2.75. (OE–34006)

A catalog of all motion pictures and filmstrips by agencies of the Federal Government which were available for public educational use in the United States as of July 1, 1960. Entries are many and varied, ranging from the photographic recordings of scientific test data and the copyrighting of commercial films to the production and execution of substantive programs authorized by the Congress. Each entry includes a brief description of the item, a summary of its contents, an indication of the source from which a copy may be obtained, and information concerning availability for television exhibition. A subject index is appended.

From Other Government Agencies

Federal Legislation Concerning Education and Training: Enactments of 1961 and Issues of 1962. A report to the Subcommittee on Education of the Committee on Labor and Public Welfare, U.S. Senate, prepared by the Legislative Reference Service, Library of Congress. Washington, U.S. Government Printing Office, 1962. 95 p.

Summarizes the educational and training provisions of legislation enacted by the Congress during 1961; identifies major issues concerning education and training before the 87th Congress at the beginning of its 2d session, 1962; summarizes the action, if any, taken by the 87th Congress on bills relating to these issues during the 1st session, 1961; analyzes the larger issues; and sets forth some of the explanations and arguments that have been advanced by proponents and opponents of the various bills. Appendices contain the recommendations by President Kennedy during 1961 concerning legislation affecting education; the text of the President's message on education, February 6, 1962; and a selected bibliography on proposed Federal aid for education.

Current Projects on Economic and Social Implications of Science and Technology, 1961. Washington, U.S. Government Printing Office, 1962. 116 p. 40 cents. (National Science Foundation, NSF–62–4.)

An inventory of 262 projects pertaining to some aspect of social science research on science and technology in progress during 1961 at U.S. colleges offering the doctoral degree in the social sciences and related disciplines. The expanded scope of this third annual inventory includes the broader aspects of science and technology. The majority of the projects receive some or all of their support from the Federal Government. Other related compilations of research projects are listed in an appendix.

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